Interim Report of the Crosswalk Safety Task Force

Legislative Recommendations

July 31, 2007

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EXECUTIVE SUMMARY

Over the past several years Nova Scotians have expressed concerns about crosswalk safety. According to the Road Safety Advisory Committee (RSAC) there are at least three pedestrians seriously injured or one killed a month as a result of a pedestrian collision.[1] The Nova Scotia government is currently addressing a number of road safety issues. These measures have made, and continue to make, Nova Scotia's highways and roadways safer. As one part of a complete road safety initiative, the issue of crosswalk safety is under review for improvement.

The Task Force considered the information within materials reviewed, the presentations given, and public comments received; and concluded that the current legislation specific to pedestrian and crosswalk safety is inadequate. The present legislation is unclear and enables an inconsistent interpretation of the Motor Vehicle Act (MVA), specifically Section 125, as it pertains to pedestrian and crosswalk safety. It does not lend itself to the development of comprehensive educational materials. Moreover, the legislation is not compatible with the current traffic issues challenging pedestrian safety nor does it define the roles and responsibilities of drivers and pedestrians sufficiently.

Based on the results of the activities undertaken between April and July 2007, as well as the completion of a comprehensive literature review, this report seeks to confirm that legislative amendments are required and are an important step in developing future recommendations for the final report. The literature review verified for the Task Force that the two underlying theories they are using, and are discussed at length throughout the report, are correct and should be considered the only two consistent 'best practices' found. Firstly, that it is considered a best practice to view the crosswalk safety issue, as well as most road safety issues, through a comprehensive lens that combines education, enforcement, engineering, and evaluation. The second 'best practice' is to think of crosswalk safety as a shared responsibility between drivers and pedestrians that is contingent upon respecting the rules of the road.

Recommendations

After reviewing all the evidence and information presented to the Task Force members felt that the current legislation, specifically Section 125 of the MVA, required clarification and amendment. Particularly, the Task Force felt the idea that both drivers and pedestrians have a shared responsibility in crosswalk safety needed to be formally expressed in legislation. The Task Force is recommending that the following areas require clarification and amendment:

- the roles and responsibilities of drivers and pedestrians in divided and multilane highways situations need to be identified;
- the meaning of the flashing and solid "don't walk" signal needs to be defined;

[1] Sarah Chisholm, & Catherine Kennedy, "Crosswalk Safety: Current Themes in Literature," Literature Review. 2007 : 2.

- emphasizing shared responsibility of pedestrian and driver responsibilities regarding the:
    - definition of a crosswalk
    - use of the term 'lawfully in crosswalk', and
    - use of pedestrian activated signals;
- subdividing Section 125 of the MVA into 'Driver Responsibilities' and 'Pedestrian Responsibilities.'

INTRODUCTION

The Province has experienced numerous changes in traffic conditions since the last review of crosswalk safety in 1990. During the mid 1990s, Nova Scotia was undergoing many transformations regarding transportation. These changes came in the form of increased volumes of vehicles and pedestrians that paralleled with the increase of urban sprawl. There were structural transformations within government departments and organizations that affected roles and responsibilities, and program and service delivery in relation to transportation. There were funding changes and reductions to programs related to traffic and pedestrian safety.

As a result, there was an increase in concern for road safety, particularly in response to Canada's high collision rates. In comparison to other industrialized countries Canada was one of the worst of the industrialized countries. It appeared that the general public's complacency towards road safety was a contributing factor to the collision rates. Many provincial governments began to change their approach to addressing road safety issues in response. The method for addressing road safety issues took on a more multi-disciplinary and collaborative approach. Nova Scotia established the Road Safety Advisory Committee (RSAC) as one way to examine road safety issues using this latest approach. RSAC was, and continues to be, instrumental in exploring many road safety issues.

In an effort to use a focused approach to addressing road safety concerns there are four sub-committees to RSAC:

- alcohol countermeasures and traffic enforcement,
- vehicle occupant safety,
- strategic communications, and
- vulnerable road users (pedestrians, cyclists, and motorcyclists).

Since the establishment of RSAC, Nova Scotia has made improvements to road safety. An examination of the crosswalk safety issue may be appropriate; however, as RSAC's four sub-committees demonstrate there are a number of road safety issues. Crosswalk safety is just one of the road safety issues that are being addressed by the Nova Scotia Government, RSAC, and Halifax Regional Municipality. Alcohol remains the most serious and leading factor associated with fatalities and serious injuries in crashes; while speed, distractions and other forms of impaired driving continue to be a significant concern for driver, passenger and pedestrian safety. It is important that the progress that has been made in crosswalk safety continue to move forward, and remain a focus in the context of the other threats to safety on our roads.

As an additional measure to address road safety issues, the Minister of Transportation and Public Works (TPW) and the Mayor of Halifax Regional Municipality (HRM) jointly announced in April 2007, the appointment of a ten member Crosswalk Safety Task Force (Task Force).

The Task Force's responsibilities are to review all relevant research, reports and background material; solicit presentations from experts and stakeholders (as required); document relevant past and current rules, programs and practices that support crosswalk safety including, but not limited to, legislation, engineering, public awareness and education, enforcement, and emergency response; and prepare a report. The objective of the report is to identify strategies and measures to improve crosswalk safety in Nova Scotia within this new and dynamic environment.

The issue of crosswalk safety is an interdisciplinary subject that requires using a variety of research methods:

- reviewing and analyzing statistics;
- conducting literature and jurisdictional reviews;
- reviewing past reports, studies, and submissions; and
- examining legislation.

Employing these strategies enables the Task Force to address the concern of crosswalk safety holistically and effectively.

The Task Force's structure was designed to have representation from key stakeholders and individuals with expertise in the core areas of: education, engineering, and enforcement. When discussing transportation issues, such as crosswalk safety, it is common to view the issue from these three areas. A key component underlying each of the three areas is evaluation, which identifies the effectiveness of a particular strategy or program. Evaluation can be considered a fourth "E" and is a core area that should be noted.

To develop final recommendations, it is essential to have an understanding of the present legislation that governs pedestrian activities. Gaining this understanding meant that the Task Force had to engage in discussions, conduct jurisdictional and literature reviews, and solicit presentations from individuals who are knowledgeable about crosswalk legislation and enforcement. As a result of this process, the Task Force believes that some of the existing legislation needs to be enhanced to clarify responsibilities with regards to crosswalk safety.

Consequently, the objective of this *Interim Report of the Crosswalk Safety Task Force* (*Interim Report*) is to inform the reader of the Task Force's structure and purpose, its activities to date, and provide rationale for the Task Force's legislative recommendations.

STRUCTURE AND PURPOSE OF THE TASK FORCE

The issue of crosswalk safety is multifaceted and complex. As a result the best approach for examining the issue was to appoint an interdisciplinary task force. Using a task force is an efficient method for encouraging general discussion and developing recommendations. Task forces are flexible and adept at thoroughly examining a wide range of subjects within a concise timeframe.

Members of the Task Force were appointed because of their specific expertise and experience with various aspects of crosswalk safety; and to represent a particular organization. The Task Force was composed to facilitate the exchange of diverse ideas and suggestions and to share their knowledge.

STRUCTURE OF TASK FORCE

MEMBERS

Bernie Clancey, P. Eng. is the Manager of Traffic Engineering Services for TPW. Clancey is also the Deputy Provincial Traffic Authority for the Province of Nova Scotia, with 27 years experience in the field of traffic and transportation engineering. As Manager, his responsibilities include overseeing implementation of uniform and consistent traffic control measures on provincial highways. He is a member of the Transportation Association of Canada's Traffic Operations and Management Standing Committee, RSAC's Vulnerable Road User Sub-committee. Clancey is co-chair of the Task Force.

Ken Reashor, P. Eng. has been a professional engineer with over 35 years of experience in the field of Municipal and Transportation Engineering. His experience includes working with the Nova Scotia Housing Commission in Dartmouth for 5 years, and as an associate engineering consultant in Edmonton. Reashor was a consultant for nine years for both a private development industry and the Alberta Housing Corporation. Reashor then became a city engineer for the Town of Fort McMurray and was the Transportation Manager in the city of Calgary for 14 years. He then left municipal government to begin his own business as a private transportation consultant for 3 years. In 2003, after 26 years in Alberta, Reashor returned to Halifax to become, and currently acts as, the Manager of Traffic & Right of Way Services and the Traffic Authority for Halifax Regional Municipality. Reashor is co-chair of the Task Force.

Gilles Chaisson is the former deputy registrar of the Registry of Motor Vehicles. He was a safety education officer for 11 years, teaching highway and pedestrian safety skills in schools to elementary, junior and senior high students. He was also a defensive driving instructor and driver improvement officer. Currently, he volunteers with the Senior Safe Driving program.

Dr. Fred French holds a Ph.D. from the University of Alberta with a focus in School Psychology and has approximately 30 years experience in various roles in education. He has been with the Faculty of Education at Mount Saint Vincent University since 1985 teaching courses in Education, School Psychology and Exceptionality. His research and policy interests as they pertain to this committee lie in decision making and its implications for risk taking and at risk behaviors; the rights/responsibilities of children and youth and youth at risk particularly those with learning disabilities; and, in the development and evaluation of educational programs addressing personal/social development and responsible decision making/problem solving.

S/Sgt. Mark Furey is a 27 year veteran of the Royal Canadian Mounted Police, presently on secondment to the Nova Scotia Department of Justice (DOJ) as a Policing Consultant. As the DOJ representative on RSAC, he is the Chairperson of the Traffic Forum Sub-committee (Alcohol Countermeasures Committee) as well as the Operation Road Safety Sub-committee. S/Sgt. Furey has extensive experience in operational and administrative duties as a Commander in both rural and urban communities.

Morris Green, B.P.E., M.S., is an Injury Prevention Health Promoter with Nova Scotia Health Promotion and Protection. He has five years working experience in injury prevention, and has been involved in health promotion projects for more than 20 years.

Rob Hird P. Eng., is a Traffic Studies Engineer with TPW's Traffic Engineering Services Group. He also serves as a member of the Vulnerable Road-users Sub-committee of the Road Safety Advisory Committee (RSAC). Hird brings 15 years experience in Traffic and Transportation Engineering and has been involved in the installation and maintenance of a number of marked crosswalks in both urban and suburban areas of the province.

Cst. Brian Lillington has 24 years experience as a police officer and has worked as a Collision Reconstructionist in the Collision Investigation Section with the Halifax Regional Police. He has worked for 7 years in the Traffic Section in Enforcement & Investigation and for 6 years been a School Liaison Officer in schools from Primary to High School. Presently, he is a member of the Vulnerable Road Users Sub-Committee, which is a sub-committee of RSAC, and held this position for three years.

Lori Payne, B.Sc., B.Sc.OT. is the Coordinator of Medical Fitness and the Acting Coordinator of Driver Competency with the Road Safety Division of Service Nova Scotia and Municipal Relations. She is a member of the Seniors' Safe Driving Committee, the Provincial Driving While Impaired Committee, and the Medical Advisory Committee on Driver Licencing.

She brings expertise in reviewing individual driver records and making recommendations for discretionary actions under the Motor Vehicle Act to the Deputy Registrar of Motor Vehicles.

Alan Taylor, P.Eng., is a Transportation Planner with HRM and is a member of the Vulnerable Road Users Sub-committee of RSAC. He has 26 years of experience in transportation engineering and planning.

Harland Wyand is employed as the Town Engineer and Traffic Authority for the Town of Bridgewater. Wyand is a Professional Civil Engineer and worked as a consultant nationally and internationally; working primarily in Municipal Engineering for 19 years prior to joining the Town. As Town Engineer and Traffic Authority, Wyand is responsible for transportation and traffic issues, municipal infrastructure and installation of traffic signs and signals aimed at improving pedestrian and vehicular safety. Wyand is an active member of the Municipal Public Works Association of Nova Scotia and represents the smaller urban municipalities' perspective and concerns on the Task Force.

Purpose of Task Force

The Task Force is required to provide a presentation on their final report and recommendations to the Minister of TPW and the Mayor of HRM, and RSAC. RSAC is an important group in this process as they inform and advise TPW, Service Nova Scotia and Municipal Relations (SNSMR), and the Department of Justice (DoJ) on matters pertaining to road safety. In reporting to RSAC, the Task Force's recommendations can influence and complement other road safety initiatives. It is anticipated that RSAC will endorse the recommendations of the Task Force.

In developing recommendations to improve crosswalk safety, the Task Force is responsible for:

- reviewing relevant research, reports and background materials;
- conducting a literature review;
- identifying and consulting with subject matter experts and stakeholders (as required);
- reviewing written submissions and presentations made to the Task Force;
- documenting relevant past and current rules, programs and practices regarding safe crosswalk practices that may be categorized into the following areas, but are not limited to: legislation, engineering, public awareness and education, enforcement, emergency response; and
- preparing an interim report and a final report on their recommendations.

The final report and recommendations are to be submitted in late fall 2007.

TASK FORCE ACTIVITIES

There have been seven meetings of the Task Force to date. The meetings have focused on a variety of issues ranging from approving the terms of reference for the Task Force, reviewing pedestrian collision statistical information and legislation (Nova Scotia and other provinces); and examining crosswalk installation practices in Nova Scotia and in other jurisdictions.

The following two sections are a brief overview of the tasks completed to date. The primary objective of this report is to review Provincial legislation and recommend legislative changes.

OVERVIEW OF RESEARCH AND ANALYSIS

The Task Force continues to conduct literature and jurisdictional reviews on crosswalk safety. The reviews to date has been extensive, while using materials from three core areas (engineering, education, and enforcement), they were combined to form a comprehensive understanding of the crosswalk safety issue. For the purposes of this section, legislative research findings are not included here as they are discussed in the "Legislative Recommendations" section.

The Task Force reviewed three foundation documents: the *City of Halifax and Province of Nova Scotia Pedestrian Safety Task Force Report* (1990), the *Crosswalk Safety and Awareness Forum Report* (2007), and public feedback to the Task Force since its announcement. These materials enabled the Task Force to establish an understanding of the evolution of crosswalk safety issues in Nova Scotia.

In comparing the *Crosswalk Safety and Awareness Forum* (*Crosswalk Forum Report 2007*) and the *City of Halifax and Province of Nova Scotia Pedestrian Safety Task Force* (*Pedestrian Safety Report (1990)*) reports, there are several similarities and some differences. Comparing the two reports allowed the Task Force to identify what has changed over the years and how these changes may have affected pedestrian and vehicle collisions. As described earlier there are three main areas that influence and shape crosswalk behaviours and ultimately policy and legislation: education, engineering, and enforcement. While the *Crosswalk Forum 2007* and *Pedestrian Safety Reports* explore these areas more in depth, for the purposes of this report, the Task Force will compare the themes of these reports.

EDUCATION

Each of the reports emphasizes the importance of a sustained and well coordinated crosswalk safety education program throughout a person's lifespan. The need for this is demonstrated by the fact both reports identify confusion between driver and pedestrian responsibilities in crosswalk safety as a contributing factor in collisions. The administration of a crosswalk safety program as part of the school system's curriculum is seen as an essential component in promoting traffic safety.

In 1996, traffic and pedestrian safety programs funded by TPW were discontinued, despite the *Pedestrian Safety Report 1990's* recommendations to not only review the curriculum but to enhance it. Funding to these safety programs ended as part of a government wide cost saving measure. In addition, the *Pedestrian Safety Report (1990)* identified methods to increase the general public's awareness of crosswalk safety i.e. media campaigns. The *Pedestrian Safety Report (1990)* and the *Crosswalk Safety Forum Report (2007)* recommended developing a comprehensive education program that would teach pedestrian and traffic safety to children starting in grade primary and up to grade twelve. The program's focus would shift from the pedestrians' responsibilities towards drivers' responsibilities as the student ages. The program's teaching strategies would be age appropriate and responsive to the students' cognitive development and life stages. The *Pedestrian Safety Report (1990)* is more explicit in this recommendation and proposes that future pedestrian safety programs should be evaluated for effectiveness and incorporation of best practices.[2]

The Task Force understands that education is an essential component in the promotion of crosswalk and traffic safety. It acknowledges that the educational recommendations of the *Pedestrian Safety Report (1990)* were not adopted, and are concerned about the consequences of government discontinuing funding for traffic related education programs. It is interested in rectifying this situation by conducting an in depth examination of education as a core area. The literature review highlighted for the Task Force areas requiring further consideration such as the lack of pedestrian safety education programs intended for seniors and conflicting research regarding the when and how to teach pedestrian safety to children.[3] The Task Force looks forward to partnering with the Department of Education and engaging other learning centres to develop well informed recommendations.

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[2] Department of Transportation & Communications, *City of Halifax and Province of Nova Scotia Pedestrian Safety Task Force Report,* Recommendations Report (Halifax: Province of Nova Scotia) : 1990; and Halifax Chamber of Commerce, "Crosswalk Safety & Awareness Forum: Changing Behaviour -- Saving Lives." Crosswalk Safety and Awareness Forum, (Halifax : Halifax Chamber of Commerce) : April 2007.

[3] Chisholm & Kennedy, "Current Themes in Literature," : 3-8.

ENGINEERING

Each of the former reports emphasizes the need to consider pedestrians when designing highways. The main theme in both reports in the area of engineering is to consider pedestrians in urban planning by designing crosswalks with consistency and coordination among municipalities, and between municipalities and the Province. The *Pedestrian Safety Report (1990)* recommends the "adoption and application of Uniform Traffic Control Devices for Nova Scotia," and the development of a mechanism where traffic authorities meet on a regular basis to monitor and evaluate traffic control devices. This recommendation was not formally adopted as is witnessed in the *Crosswalk Forum Report 2007*. Its recommendation around consistency and collaboration is less thorough and less formal, choosing instead to advocate for Nova Scotia to design highways in accordance with the Transportation Association of Canada (TAC) standards.[4]

ENFORCEMENT

When comparing both reports', there are fewer similarities for recommendations in the area of enforcement. The recommendations of the *Pedestrian Safety Report (1990)* are concerned with the lack of clarity in the Motor Vehicle Act (MVA) relating to driver and pedestrian roles and responsibilities stating the lack of "ability of police to ticket either the motorists alleged to have failed to yield at a crosswalk or pedestrians alleged to have 'jaywalked' " as problematic.[5] The *Crosswalk Forum Report 2007* was less focused in its recommendations for enforcement stating only that "speed enforcement and pedestrian responsibility [should] become a priority."[6]

It appears there have been some legislative changes since the *Pedestrian Safety Report (1990)*; however, the issue of confusion over responsibilities at crosswalks appears to continue as evidenced in the *Crosswalk Forum Report (2007).*

Comparing these two documents identified for the Task Force areas for further research and legislative recommendations.

While members of the Task Force have researched and reviewed other documents, a full discussion and analysis of these documents is best suited for the final report and recommendations.

The Task Force's legislative recommendations were also influenced by the public's comments received to date. There are several similarities between the comments and the reports. The only

[4] Halifax Chamber of Commerce, "Crosswalk Awareness."
[5] Department of Transportation & Communications, *Pedestrian Safety Task Force*, 7.
[6] Halifax Chamber of Commerce, "Crosswalk Awareness,"8.

notable difference between the comments and the reports is the degree of emphasis put on the three following areas:

- pedestrian collision penalties (both financial and incarceration),
- types of pedestrian control devices, and
- driver and pedestrian distraction.

The majority of the comments from the public suggest that current penalties are not strong enough and do not match the offense. Additionally, it appears that the public feels that current crosswalk installation practices used by the Province and HRM should be changed or enhanced to draw more attention to pedestrians. Of three areas, driver and pedestrian distraction received the most attention by the public. The Task Force acknowledges that distraction is a contributing factor in pedestrian collisions; however, is also a contributing factor in other traffic issues. The Task Force thinks it is an issue that is best addressed in the final report, within the context of crosswalk safety and may serve as way to inform future studies and recommendations regarding driver distraction.

SUMMARY OF PRESENTATIONS

Since the first Task Force meeting there have been seven presentations to the Task Force. One of these that specifically addressed legislation, and it will be discussed in the "Legislative Recommendations" section.

The following is the list of presentations to date:

- Review of Pedestrian and Crosswalk Crash Statistics
  - 1996 to Present (Paul Smith, Road Safety Engineer with TPW and Ken Reashor, HRM)
- MVA – Crosswalk Rules, Offences and Penalty Provisions
  - Michelle Higgins, Department of Justice and Solicitor for TPW
- Road Safety Skills Training Overview
  - Janet Barlow, Ecology Action Centre (EAC)
- Province of Nova Scotia Crosswalk Installation Practices
  - Rob Hird, Traffic Studies Engineer with TPW
- Alternative Crosswalk Treatments in other Jurisdictions
  - Alan Taylor,
- HRM Crosswalk Safety Booklet
  - Ken Reashor
- Literature Review Presentations
  - Catherine Kennedy from Health Protection and Promotion (HPP) and Sarah Chisholm from TPW.

The themes of the presentations tend to fall into five categories:

- crosswalk installation practices,
- education,
- statistical information,
- literature review, and
- legislation and enforcement.

CROSSWALK INSTALLATION PRACTICES

There were two presentations on crosswalk installation practices by Task Force members. Rob Hird presented Nova Scotia's crosswalk installation practices and Alan Taylor presented an overview of Alternate Crosswalk Concepts from other jurisdictions.

There are a variety of methods to mark a crosswalk influenced by such things as the volume of vehicle and pedestrian traffic, travel speed, and culture. Hird's presentation focused on current practices used for marking crosswalk installations by Nova Scotia and HRM.

This included a discussion on the official signs and markings for marked crosswalks as well as the hierarchy of treatments that are used over and above the basic markings. The Province's practices are generally in line with the guidance offered by the Transportation Association of Canada's *Manual of Uniform Traffic Control Devices for Canada* and *Pedestrian Crossing Control Manual.* The Province does not use the numerical warrant provided by the *Pedestrian Crossing Control Manual* for establishing marked crosswalks, as the rural nature of most of the Province's crosswalk requests make application difficult. However discussion revealed that HRM does use this warrant.

Hird's presentation also covered some inconsistencies in the application of markings, signs and devices that are used to mark crosswalks around the Province in many smaller municipalities. This portion of the presentation underlined the need for a uniform approach for marking crosswalks so that a consistent message is presented to drivers provincially. Aligning these standards with national guidelines will serve to provide nation-wide consistency for the treatment of pedestrian crosswalks.

In implementing these standards, Nova Scotia's traffic control devices assists drivers and pedestrians with compliance, heeding road warnings and characteristics, adapting to road hazards and temporary conditions, and assisting with route selection. Uniformity of traffic control devices simplifies the rules of the road for both drivers and pedestrians by making signs and signals easier to recognize; therefore, making their actions predictable. Predictability is an important feature in improving crosswalk safety.

Taylor's presentation was an overview of alternate crosswalk treatments in other jurisdictions around the world. The overview demonstrated the practices of other jurisdictions and showed there are a many ways to mark a crosswalk. However, there does not appear to be any variation of markings, signs or lights that is more effective than current Nova Scotia practice. Pedestrian collisions are commonly the result of driver and pedestrian actions and not a failure of the device. Signalized devices have a twofold effect for pedestrians and drivers. Pedestrians can develop a false sense of security relying on the device more than their skills. Drivers can become too familiar and complacent towards the signals decreasing the likelihood they will yield in time to a pedestrian.

In addition to the presentations given, the Task Force consulted a number of sources regarding crosswalk installation practices, specifically the Transportation Research Board's comprehensive and in depth report "Improving Pedestrian Safety at Unsignalized Crossings".[7]

EDUCATION

As was discussed in the introduction, when reviewing a transportation issue it is common to view it using three areas: engineering, enforcement, and education. These areas are not applied in isolation of one another, but rather in combination. It is understood that education is an important aspect of changing people's behaviours. Recognizing this, the Task Force had two presentations regarding educating people about crosswalk safety, one from Janet Barlow from the Ecology Action Centre and the other from Reashor.

The presentations had different target audiences and modes for communicating crosswalk safety.

Barlow presented on behalf of the Ecology Action Centre (EAC). EAC is a community organization that promotes and educates people on how they can adopt a more environmentally conscious lifestyle. Barlow's presentation focused on EAC's proposed education model that promotes safe active transportation. EAC's education model extends beyond crosswalk safety and includes cycling, skateboarding, and inline skating.

EAC's model targets school aged children and adolescents through teaching age appropriate pedestrian safety skills at various stages of their development. EAC suggests a partnership with the Department of Education would enhance this model and it could become part of the school curriculum. The proposed model teaches pedestrian safety in a classroom setting as well as through practical application. For example:

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[7] Transportation Research Board, *Improving Pedestrian Safety at Unsignalized Crossings*, Research Report (Washington, DC: Transit Cooperative Research Program & National Cooperative Highway Research Program) : 2006.

- primary to grade three students would learn road safety skills focused on walking;
- grade four and up "wheeled forms of active transportation;" and
- junior and senior students would take on the role of educating younger students for course credit and would learn pedestrian and crosswalk safety from the driver's perspective.

There is an evaluation component to the proposed EAC model that suggests the development of performance measures to assist in monitoring the program's progress and success and identify areas for improvement.

Reashor presented HRM's draft crosswalk safety booklet as another form of education. The intent of the booklet is to educate the public at large and does not target a particular group. However, the booklet could be used in schools and other learning centres. It outlines the current rules governing crosswalk safety and what is expected of pedestrians and drivers in HRM. The intent is to distribute the booklet to each HRM household and make it available at various HRM centres, transit terminals, libraries etc. The Task Force reviewed this booklet and felt that, with some adaptations it could be used as a Province wide educational tool, when distributed to the appropriate Provincial organizations and groups.

The information contained within both presentations demonstrated the benefit of a well developed road safety education program as a method of enhancing crosswalk safety. The information confirms the importance of well defined legislation when formulating educational programs. Legislation provides the foundation and content from which educational programs are developed. Further research and a presentation from the Department of Education are required before any formal recommendations are proposed. However, the Task Force expects to make recommendations that promote the development and introduction of a formal and consistent pedestrian and traffic educational program for schools and other learning environments. In 1996, funding to TPW programs was discontinued and these programs have not been maintained.

There are other important features that were discussed during these presentations, but for the purposes of the *Interim Report* it is important to recognize that pedestrian road safety is a lifelong skill that needs to be reinforced throughout an individual's life both as a driver and a pedestrian. It is anticipated that the Task Force will form a recommendation that a formal program be developed for the school system and other learning environments. The formal program would extend beyond the classroom environment to address other populations such as seniors and persons with disabilities.

STATISTICAL INFORMATION

Paul Smith (TPW) and Reashor (HRM) provided the Task Force with the current pedestrian collisions statistics for the Province and HRM, respectively. In reviewing these statistics the Task Force identified areas where more detailed information was required for analysis.

Initial reviews of the statistical information indicates further analysis be completed before trends can be determined. The statistics also suggest that there is room for improvement in some areas of crosswalk safety that may be addressed through a number of strategies. A full analysis and discussion will be included in the final report.

LITERATURE REVIEW

The Task Force would like to acknowledge and thank Sarah Chisholm and Catherine Kennedy for conducting a literature review and making an important contribution to the process of examining the crosswalk safety issue.

The literature review was undertaken on behalf of the Task Force to assist them in fully understanding the crosswalk issues as it has been studied and examined within an academic realm using the most current information available. The literature review presentation was separated into the three core areas, education, enforcement, and engineering to thoroughly research the issue within each of these areas. There were three important findings that came from the literature review. Firstly, that there are no defined best practices regarding crosswalk safety in any of the core areas; secondly, (and perhaps related to this) is that no one area exists in isolation. If a program or strategy is implemented in order to enhance crosswalk safety, it must incorporate all areas (education, enforcement, and engineering) and be comprehensive in its approach. Conversely, it is essential to develop a basic understanding of each of the areas before advancing any particular approach. Thirdly, for a comprehensive approach to be determined successful it must be evaluated to identify where improvements are needed or where strengths can be built upon.

With regards to the educational materials reviewed there were a number of important revelations that the Task Force was not aware of prior to the literature review. Chisholm and Kennedy found that there is conflicting studies regarding how and when pedestrian education should be introduced to children. Some studies have suggested that pedestrian education should be introduced at an early age (primary – grade three) to instill safe behaviours. Conversely, other studies suggest that the parts of the brain used for depth perception, peripheral vision, and judging distance and speeds of objects are not fully developed until around the age of ten. It may not be advantageous to teach children

early about pedestrian safety because the concepts may not be fully understood and may result in children, and their parents, feeling over confident about their abilities.

The decision of when to teach children about pedestrian safety is further complicated when considering Chisholm and Kennedy's observations regarding how to teach these programs. The literature reviewed suggests that showing videos or having individuals come into a classroom setting and teach children may not be as effective as previously thought. While the children are able to memorize what they are supposed to do in certain situations they do not necessarily internalize and practice safe crossing behaviours. Instead, it was suggested using a peer to peer learning method or a practical application may be more effective; in one instance a teacher used a real life example of a child that died as a result of a pedestrian collision to teach the children about the consequences of not practicing correct behaviours. The research demonstrated that real situations may also be the most effective in terms of public education and with programs specific to seniors.

Chisholm and Kennedy identified two gaps related to education. Firstly, there is a huge lack of education targeted at older adults. Considering the current statistics, Nova Scotia has the highest ageing population. This has significant implications for the development of a comprehensive pedestrian safety education package. An education package would have to include basic information about the rules of the road concerning pedestrian safety as some individuals may not have had a formal introduction to them or kept up with changes. As people age they may no longer be able to drive – either by choice or due to medical limitation(s) that prevent them from maintaining their license – as well a number of older adults may chose to move into larger municipalities to be closer to amenities. The combination of these factors means the number of pedestrians will increase. An increase in the number of pedestrians is one factor to consider. Another is the fact that some of these pedestrians will have mobility, hearing, and visual limitations that will have to be addressed through educational techniques and crosswalk devices. Any educational programs designed for older adults must support and maintain their skills pertaining to pedestrian safety, while at the same time continue to be responsive and flexible enough to adapt to their changing abilities. The same holds true for any proposed engineering crosswalk installation practices; they must build on older adults' existing understanding of how these devices work for them.

Secondly, there needs to be some education targeted towards the enforcement community so they are familiar with the rules of the road and the related penalties to confidently enforce them. Some jurisdictions have very strict penalties for drivers and pedestrians who do not comply with the rules. Strict penalties alone do not ensure safety, the jurisdictions that do have high penalties have other countermeasures to support pedestrian safety such as high levels of enforcement, education strategies, and various traffic control devices. It is the combination of these strategies that support pedestrian safety and the penalties are seen as the final deterrent.

The literature review report and presentation explored the various types of crosswalk installation practices used. Similar to Hird and Taylor's presentation, Chisholm and Kennedy identified that there is no one method that is more effective than another. There are crosswalk devices that with

initial evaluations suggest there may be an advantage to using them such as countdown signals, traffic calming measures, and in pavement lighting. Regardless of how successful a crosswalk device appears to be, the report and presentation stress that most conclusions are based on short-term evaluations that possibly are measuring a 'novelty effect'.

As discussed above, the educational findings have a significant impact on the development and use of future crosswalk devices. Given children do not develop the cognitive capacity to safely cross the road until the age of ten, this gap may need to be supported through engineering measures. As well, the crosswalk devices will also have to adapt to support older individuals to cross the road safely.[8] Additionally, future education programs will have to include informing parents that children should be supervised when crossing the road until the age of 10. Older adults may also be interested in learning methods and adaptive skills to support them in practicing pedestrian safety.

SUMMARY

All of the presentations given to date have confirmed for the Task Force that any strategy recommended must be implemented using a collaborative and comprehensive approach, which cuts across disciplines and involves partnering with a number of stakeholders, and contemplates how evaluation will be conducted.

LEGISLATIVE RECOMMENDATIONS

BACKGROUND DISCUSSION

Legislative recommendations are one component in a spectrum of possible strategies that enhance crosswalk safety. These changes complement other government strategies being used to address other road safety issues, by making these changes and informing the public of them the residual effect will be a better awareness of the importance of compliance with the rules of the road. The recommendations are forwarded with the understanding that they lay the groundwork for future recommendations by the Task Force. Consequently, the majority of the recommendations are only meant to clarify and enhance existing legislation. Clarifying the present legislation enables the development of reliable and current educational materials, enforcement strategies, and installation of crosswalk devices. The legislative changes will assist in providing a consistent and precise message to the public and law enforcement officers. A consistent message and clear legislation allows officers to enforce the laws with confidence so that the courts will interpret the legislation similarly. Being able

[8] Chisholm & Kennedy, "Current Themes in Literature," 2007.

to confidently enforce the legislation will hopefully reinforce the public's knowledge of the rules of the road regarding crosswalk safety and ultimately decrease pedestrian collisions.

The proposed wordings for legislative amendments are only suggestions and are meant only to provide legislators with an understanding why these changes are being forwarded.

The legislative recommendations presented here are the result of several Task Force discussions; a presentation by Michelle Higgins (Solicitor for TPW from the Department of Justice); discussions with Len MacKay (Crown Prosecutor), Cst. Brian Lillington (HRP), and S/Sgt. Mark Furey (RCMP and Department of Justice); other jurisdictions' legislation; and the literature review.

Discussions around legislation began with a presentation in the first Task Force meeting. Michelle Higgins outlined the current MVA legislation, focusing on relevant definitions and pedestrian sections, with particular reference to Sections 125–127. Understanding the legislation is fundamental as it informs the development and implementation of recommendations regarding crosswalk safety.

The Task Force considered three factors when developing their legislative recommendations: legislation, enforcement, and prosecution. Exploring each of these factors required consulting subject matter experts Higgins, officers S/Sgt. Furey and Cst. Lillington, and Crown Prosecutor Len MacKay.

Higgins' presentation identified pedestrian sections and definitions in legislation where further clarification may be required; particularly: the definition of *right of way* ("privilege of *immediate* use of highway.") and the phrase that drivers must yield to pedestrians "lawfully in a crosswalk". Through this the Task Force gained a better understanding of the existing legislation and could focus their attention to areas that required further exploration.

Cst. Lillington and S/Sgt. Furey engaged in conversations with the Task Force regarding the enforcement of present legislation and identified that there were no specific or immediate concerns. Cst. Lillington and S/Sgt. Furey highlighted the apparent lack of education among the public regarding crosswalk rules. While they did not identify concerns related to legislation, they were concerned with the lack of policing resources to enforce legislation adequately. The public's lack of knowledge and respect for the laws, in combination with the limited number of traffic police officers to enforce rules, reinforces dangerous crosswalk behaviour and ultimately contributes to pedestrian collisions.[9]

It was through these discussions the Task Force learned improvements were needed to streamline the process for police officers to notify the Registry of Motor Vehicles (Registry) of pedestrian collisions. Members of the Task Force suggested that at present it may take several months for the

[9] Michelle Higgins, (Department of Justice), "Motor Vehicle Act - Crosswalk Rules, Offences and Penalty Provisions," Presentation, (Crosswalk Safety Task Force Meeting : Halifax) : May 17, 2007.

Registry to receive a pedestrian collision report. The lapse in time is not conducive to effectively and efficiently address and explore the incident with the driver. A preliminary notification should be sent anytime there is an incident involving a pedestrian in a crosswalk, regardless of whether the driver is fully or partially responsible or if they have been charged. It appears that police agencies may be unaware that they are able to send preliminary reports by fax or mail and reduce the time delay in reviewing drivers involved in pedestrian collisions under the current system.

Police agencies should be informed of the benefits of sending preliminary reports earlier, particularly as it enables the Registry to review the driver's record and determine whether discretionary action is required. The discretionary action may result in a request for the driver to undergo a medical examination, take a defensive driving course, complete a re-examination, or even suspend their driver's license. The authority to exercise these discretionary abilities is in Sections 279 (2) and 280 of the MVA (Refer to Appendix A).

It appears that the police agencies may be unaware of the Registry's discretionary abilities or the ability to send preliminary reports by fax. It is possible this information may encourage police officers to send reports sooner. In addition, informing the public of the discretionary abilities of the Registry will help the public to better understand the Registry's roles, responsibilities, and accountability to the police agencies and the public.

The Task Force felt that this knowledge about the Registrar's role and discretionary abilities in relation to pedestrian collisions was important as it:

- demonstrates where current legislation is effective;
- identifies the importance of receiving preliminary reports sooner so drivers can be reviewed and appropriate action taken if required; and
- educates the public and police agencies on the Registrar's role in appropriately and effectively addressing pedestrian collisions.

MacKay, a Crown Prosecutor with the Province, was invited to discuss his knowledge and expertise regarding prosecuting offences relating to pedestrians and crosswalks. MacKay agreed with the officers that there are no specific issues with prosecuting offenders under the current legislation. He did share with the Task Force that in other jurisdictions shared responsibility between drivers and pedestrians is emphasized more within their legislation that it is in Nova Scotia's MVA. MacKay's information led to further research by Task Force members to identify and compare Nova Scotia's legislation to other jurisdictions. This comparison exercise pinpointed areas and methods on how existing legislation may be better defined.[10]

[10] Highway Safety Code . No. R.S.Q. c. C-24.2. Quebec Government. updated 15 April 2007; Highway Traffic Act. No. C.C.S.M. c. H60. Manitoba Government. updated 2007; Highway Traffic Act. No. R.S.O. CHAPTER H.8. Ontario. 1990; Highway Traffic Act. No. RSNL CHAPTER H-3. Newfoundland and Labrador. 1990; Highway Traffic Act. No. Chapter H-5. Prince Edward Island Government; Highway Traffic Act. No. R.S.A. 2000, c. H-8. Alberta Government;

The Task Force acknowledges that there are no specific prosecution issues with existing legislation; however, the theme of confusion over driver and pedestrian responsibilities at crosswalks continues to emerge. In reviewing the present legislation, the Task Force identified some of the common misinterpretations that are in the public regarding the crosswalk rules. The Task Force's legislative recommendations are meant to clarify legislation with the expectation it will enhance education programs and improve enforcement capabilities.

Task Force members had several discussions regarding the information that was presented and reviewed. Considering the foundation materials, discussions, jurisdictions' legislation, the literature review, and presentations, they identified the following areas for further discussion and clarification:

- divided and multilane highways
- definition of 'right of way'
- the meaning of the flashing "don't walk" signal;
- emphasizing shared responsibility by clarifying pedestrian and driver responsibilities regarding the:
    - definition of crosswalk
    - use of the term 'lawfully in crosswalk', and
    - use of pedestrian activated signals;
- subdividing Section 125 of the MVA

RECOMMENDATIONS

The Task Force proposes the following recommendations based on everything discussed in this report. It forwards these recommendations with the belief that in order to be effective; the legislation has to be supported using a comprehensive approach; which addresses crosswalk safety as one component within the larger issue of road safety. Underlying the entire report is the understanding that drivers and pedestrians are equal partners in crosswalk safety and share the responsibility for complying with the rules of the road.

Motor Vehicle Act. No. CHAPTER M-17. New Brunswick Government; Motor Vehicle Act. No. [RSBC 1996] CHAPTER 318. British Columbia Government; Motor Vehicle Act . No. CHAPTER 153. Yukon Government. Revised Statutes of the Yukon 2002; Motor Vehicle Act. . No. R.S., c. 293, s. 1. Nova Scotia Government. 1989.

[10] The following is the current wording of Section 93 (1)(i) "don't walk" light - pedestrian traffic facing this signal shall not proceed across an intersection or highway" (Motor Vehicle Act). – The reviewed legislation assisted in developing the wording for the legislative suggestions.

DIVIDED & MULTILANE HIGHWAYS

There were number of themes that continued to emerge in discussions which were verified in the literature review. Specific to the following recommendations was the three categories engineers use in determining what interventions to use for pedestrian safety: "those that separate pedestrians from vehicles by time and space, those that increase the visibility and conspicuity of pedestrians, and those that reduce vehicle speeds."[11] In order for these devices to be effective they should be supported by legislation. In reviewing the current legislation, the Task Force identified the lack of a clear statement underlining the expectations of drivers and pedestrians regarding divided highways. It was highlighted in the literature review that most pedestrian collisions occur at marked crosswalks and in multilane highways. These situations can present a 'multiple-threat' to the pedestrian[12] because of the volume and speed of the traffic. In order to legislatively create a separation between pedestrians and drivers in these types of situations, the Task Force proposes introducing a statement that clearly outlines the legal obligations of both parties. The addition to the legislation will present an opportunity to develop clear and defined educational information and present a learning opportunity to disseminate this information to drivers and pedestrians. The Task Force expects the proposed recommendation will enhance public awareness and be a strategic first step in raising public awareness about crosswalk safety. It will be new information for people to learn and an opportunity to reinforce existing crosswalk rules.

Additionally, the Task Force wants to legislatively outline for the driver what to watch for when approaching a non signalized crosswalk and how to proceed when encountering pedestrians in a divided highway situation.

This recommendation is also a good balance between safety and the reality of the need to keep traffic flowing smoothly.

Legislative Recommendation 1:
The Task Force is recommending that Section 125 of the MVA be amended to reflect the following:

- Where pedestrian movements are not controlled by traffic signals, the driver of a motor vehicle shall yield the right of way to the pedestrian lawfully within a crosswalk or stopped facing the crosswalk.
- Where directional flow of traffic on a highway is divided into two separate roadways by a defined median, the driver of a motor vehicle shall yield the right of way to a pedestrian lawfully within a crosswalk or stopped facing the crosswalk on the half of the highway on which the vehicle is traveling.

[11] Chisholm & Kennedy, "Current Themes in Literature," 11.
[12] ibid., 16.

DEFINITION OF 'RIGHT OF WAY'

In Higgins' presentation it was stated that the definition of 'right of way' means "the privilege of the immediate use of the highway." Task Force members discussed the meaning of the word 'immediate' and when that occurred and debated if it was clear to the public. After conducting a jurisdictional review of legislation regarding the definition of 'right of way', it was identified that, other than Nova Scotia, New Brunswick[13] was the only other province to define right of way. The Task Force examined the present legislation and decided because the term 'right of way' is used in various capacities and covers a multitude of situations outlined in the MVA it should remain. However, after reviewing several other documents and engaging in several discussions the Task Force thought that a definition specific to yielding the right of way to a pedestrian was needed. Adding this definition would be a benefit and would acknowledge the obvious differences between yielding to another vehicle and yielding to a pedestrian.

'Yielding the right of way to a pedestrian'

Section 125 of the MVA as a whole governs crosswalk behaviours; however, it does not articulate the roles and responsibilities of the driver and the pedestrian. The Task Force is recommending a couple of amendments to solidify the shared responsibilities and to define the roles. Other jurisdictions outline this in a variety of ways, separating the crosswalk section as either "pedestrian rights" or "driver responsibilities" outlining the expectations of both parties. Section 125 is called "Pedestrians" and discusses mainly the driver's responsibilities to stop, while at the same time including the pedestrian's responsibility to give the right of way to vehicles when crossing a roadway without a crosswalk. In view of this, it is recommended that Section 125 be modified to reflect the three recommendations as described in the following explanations.

As stated earlier in the report, the Task Force thought that a definition for 'yielding the right of way to a pedestrian' would acknowledge the differences between yielding to another vehicle and yielding to a person. Moreover, including a definition specific to crosswalk situations underscores for the driver what exactly they must do when at a crosswalk, particularly in the case of mid-block crosswalks. The definition specifically requires the driver to stop for a pedestrian to prevent or lessen the chance of a serious collision.

[13] Motor Vehicle Act. No. CHAPTER M-17. New Brunswick Government.

Legislative Recommendation 2:

The Task Force is recommending that for the purpose of Section 125 of the MVA, a statement to this affect should be included to reflect the following:

- For the purpose of Section 125[14] of this Act a statement to this affect should be included:
  - "Yield the right of way to a pedestrian" means the operator of a vehicle is required to stop to avoid endangering, colliding with or interfering in any way with pedestrian travel."[15]

'DON'T WALK' SIGNAL

During conversations, the Task Force discussed that it seemed some drivers and pedestrians were unclear whether pedestrians could begin to cross a roadway when the 'Don't Walk' signal is flashing. Task Force members agreed that a 'Don't Walk' signal, flashing or not, meant pedestrians could not enter the crosswalk, but if they were already in the crosswalk they were to continue their crossing. It also indicated to the driver to wait until all pedestrians have completed crossing prior to proceeding. However, observations of pedestrians and drivers by members of the Task Force suggested that a 'flashing Don't Walk' signal is not always being interpreted the same way. Members representing HRM confirmed this was an issue for them. To address the issue, a review of jurisdictions' legislation[16] was conducted. The review demonstrated that some provinces had detailed instructions for pedestrians and drivers regarding both 'flashing' and 'solid' 'Don't Walk' signals.[17] Those provinces' legislation clearly states that pedestrians could not begin to cross a roadway when the

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[14] The following is the current wording of Section 125 of the MVA:
Pedestrian and vehicle rights of way
125 (1) The driver of a motor vehicle shall yield the right of way to a pedestrian lawfully within a crosswalk.
(2) Whenever a vehicle has stopped at a crosswalk or at an intersection to yield to a pedestrian pursuant to subsection (1), it shall be an offence for the driver of any other vehicle approaching from the rear to overtake and pass the stopped vehicle.
(3) Every pedestrian crossing a roadway at any point other than within a crosswalk shall yield the right of way to vehicles upon the highway.
(4) This Section shall not relieve the driver of a vehicle or the pedestrian from the duty to exercise due care. *R.S., c. 293, s. 125; 1990, c. 36, s. 1; 2001, c. 12, s. 4.*

[15] This definition was adapted from Wisconsin's traffic legislation ("Yield the right-of-way to a pedestrian").

[16] Highway Safety Code . No. R.S.Q. c. C-24.2. Quebec Government. updated 15 April 2007; Highway Traffic Act. No. C.C.S.M. c. H60. Manitoba Government. updated 2007; Highway Traffic Act. No. R.S.O. CHAPTER H.8. Ontario. 1990; Highway Traffic Act. No. RSNL CHAPTER H-3. Newfoundland and Labrador. 1990; Highway Traffic Act. No. Chapter H-5. Prince Edward Island Government; Highway Traffic Act. No. R.S.A. 2000, c. H-8. Alberta Government; Motor Vehicle Act. No. CHAPTER M-17. New Brunswick Government; Motor Vehicle Act. No. [RSBC 1996] CHAPTER 318. British Columbia Government; Motor Vehicle Act . No. CHAPTER 153. Yukon Government. Revised Statutes of the Yukon 2002; Motor Vehicle Act. . No. R.S., c. 293, s. 1. Nova Scotia Government. 1989.

[17] The following is the current wording of Section 93 (1)(i) "don't walk" light - pedestrian traffic facing this signal shall not proceed across an intersection or highway" (Motor Vehicle Act).

'Don't Walk' signal is flashing, and to complete their crossing if the pedestrian is already in the crosswalk. It also confirmed that while the driver was to anticipate that pedestrians would not begin crossing when the 'Don't Walk' signal was flashing, it does not relieve them of the duty to exercise due care.

Considering the members' experiences, other jurisdictions' legislation, and existing educational programs, the Task Force agreed the legislation needed to be amended.

Legislative Recommendation 3:

The Task Force recommends Section 93 (2) (i) of the MVA should be amended to reflect the following statement:

- 'don't walk' light - Pedestrians facing this signal, either flashing or solid, shall not start to cross the highway in the direction of the signal; and pedestrians who have legally and partially crossed the highway shall continue to proceed and complete their crossing."

EMPHASIZING SHARED RESPONSIBILITY

To legally support the idea that there is an equal partnership between pedestrians and drivers the legislation must be adapted to reflect this concept. The Task Force deemed it fair to enhance driver responsibilities and introduce a section that defined pedestrian responsibilities better than is currently done in existing legislation.

Pedestrian Responsibilities

While the above requires the driver to stop and yield to the pedestrian, the driver must have an expectation of types of pedestrian action to watch for. Initially the Task Force's discussions focused on the definition of crosswalk[18] and the use of the phrase 'lawfully in the crosswalk' in Section 125. There were concerns that a combination of the definition of crosswalk and the phrase did not articulate when a person was considered to be lawfully within the crosswalk. This is important for a number of reasons, the driver needs to know when to prepare to stop for a pedestrian and enforcement and prosecution need to know at what point a driver can be cited for failing to yield. The definition of crosswalk has to be clear to encourage a consistent interpretation of this statement by the courts and enforcement officers.

[18] 2 (h) "crosswalk" means that portion of a roadway ordinarily included within the prolongation or connection of curb lines and property lines at intersections or any other portion of a roadway clearly indicated for pedestrian crossing by lines or other markings on the surface" (Motor Vehicle Act).

Upon further discussion and the review of jurisdictional legislation, it was decided that clarification was not required as all members agreed the pedestrian was lawfully in the crosswalk when they stepped off the curb. The Task Force was concerned that in order to be lawfully within a crosswalk a pedestrian had to put themselves in harm's way. Developing a balance between driver expectations on what to watch for, and what actions pedestrians are required to take prior to crossing, requires legislative support.

To mitigate these concerns for putting pedestrians in harm's way and creating driver expectations, the following recommendation is made.

Legislative Recommendation 4:

The Task Force recommends the following be added to Section 125 of the MVA:

- A pedestrian shall stop and not leave a curb or other place of safety and walk or run into the path of a vehicle that is so close that it is impracticable for the driver of the vehicle to yield the right of way to the pedestrian.

- Every pedestrian crossing a roadway at any point other than within a crosswalk shall yield the right of way to vehicles upon the highway. Where a pedestrian is crossing a highway that has a pedestrian activated signal, the pedestrian shall ensure the signal is activated prior to crossing.

The Task Force recognizes that crosswalk safety is a shared responsibility between the driver and the pedestrian. As a result of adopting this recommendation, the MVA solidifies the shared responsibility by including and defining the obligations of the pedestrian. Including this recommendation assists in crosswalk safety by reminding pedestrians to take the proper precautions before crossing to ensure they can do so safely at *all* types of crossings. Insisting pedestrians stop will make them more visible to drivers, because it will give drivers an opportunity to look for pedestrians and more time to stop.

Incorporating the role of the pedestrian enhances education packages by providing defined content pertaining to the pedestrian. The recommendation demonstrates the pedestrian's legal obligation to stop and cross when it is safe to do so, clarifying what is expected of them. It also strengthens an officer's ability to enforce the pedestrian's legal responsibility.

Subdividing Section 125 of the MVA

As is evidenced throughout this report, crosswalk safety is a shared responsibility between driver and pedestrian. In an effort to embrace this, the Task Force would like to formalize this relationship by articulating this shared responsibility in the MVA in two ways. First, the Task Force is recommending that Section 125 be subdivided into two segments, 'driver responsibilities' and 'pedestrian responsibilities'. The two segments optically demonstrate that there are two parties and

plainly state their expectations when the two meet on a highway or roadway. Second, incorporating a segment pertaining to pedestrians identifies them as an equal partner in pedestrian and crosswalk safety.

Legislative Recommendation 5:
The Task Force is recommending that Section 125 of the MVA be amended to divide responsibility for crossing safety between drivers and pedestrian as follows (contents of each section include existing and proposed legislation):

Driver Responsibilities

- Where pedestrian movements are not controlled by traffic signals, the driver of a motor vehicle shall yield the right of way to the pedestrian lawfully within a crosswalk or stopped facing the crosswalk.
- Whenever a vehicle has stopped at a crosswalk or at an intersection to yield to a pedestrian pursuant to subsection (1), it shall be an offence for the driver of any other vehicle approaching from the rear to overtake and pass the stopped vehicle.
- Where directional flow of traffic on a highway is divided into two separate roadways by a defined median, the driver of a motor vehicle shall yield the right of way to a pedestrian lawfully within a crosswalk or stopped facing the crosswalk on the half of the highway on which the vehicle is traveling.
- This Section shall not relieve the driver of a vehicle from the duty to exercise due care.

Pedestrian Responsibilities

- A pedestrian shall stop and not leave a curb or other place of safety and walk or run into the path of a vehicle that is so close that it is impracticable for the driver of the vehicle to yield.
- Every pedestrian crossing a roadway at any point other than within a crosswalk shall yield the right of way to vehicles upon the highway. Where a pedestrian is crossing a highway that has a pedestrian activated signal, the pedestrian shall ensure the signal is activated prior to crossing.
- This Section shall not relieve the pedestrian from the duty to exercise due care for their own safety.

Defining the roles and responsibilities enables enforcement officers and educators to reinforce the idea that both parties are responsible for using crosswalks safely and there is a legal obligation for them to do so. Also, in an effort to clearly demonstrate that it is not only an issue of responsibility but one of safety both subsections state that the legislation does not 'relieve' either "from the duty to exercise due care". When all road users comply with the rules of the road, it contributes towards collision avoidance.

Task Force members discussed at length the possibility of increasing or changing the penalties for pedestrians and drivers who do not comply. Nova Scotia's penalties are already the strictest penalties in the country. (Refer to Appendix A) The penalties are not currently matched with appropriate levels of enforcement or enforcement strategies or accessible educational information. Most importantly no one strategy from a particular area – education, enforcement or engineering – will work without using a comprehensive approach where each area is supported and complemented by the others. Therefore, until the Task Force is able to develop a comprehensive understanding of the current crosswalk situation in Nova Scotia, it may be premature to assume increasing penalties results in a decrease in pedestrian collisions.

NEXT STEPS

Task Force members have identified other possible presenters, particularly the Department of Education, and areas for further research. Further analysis of the statistics is required in combination with a further literature review on crosswalk devices as well as factors that influence pedestrian and driver behaviours.

Additional recommendations have been identified and will be explored and analyzed to determine how effective they will be in increasing the public's awareness of crosswalk safety and in decreasing collisions. Where possible, the Task Force will identify the implications and resources required to implement the recommendations. Any of the recommendations forwarded will only be successful when they are part of a continuum of strategies that combine enforcement, engineering, and education. Strategies should be subject to an evaluation process that enables the strategy to be monitored and improve upon before, during and after implementation. The Task Force is conscious of the fact their recommendations do not exist in isolation and anticipate they will complement other government initiatives that address other road safety issues.

The Task Force is looking forward to continuing their work on crosswalk safety and receiving written submissions by any interested parties. The Task Force is gathering the necessary information to provide the Minister of TPW, the Mayor of HRM, and RSAC with a final report on their recommendations in late fall 2007.

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APPENDIX A

The following are the Sections from the MVA that were discussed and referred to throughout the *Interim Report* in order of their appearance in the act.

DEFINITIONS

1 (be) "right of way" means the privilege of the immediate use of the highway;

Traffic signals

93 (2) (i) (i) "don't walk" light - pedestrian traffic facing this signal shall not proceed across an intersection or highway;

PEDESTRIANS

Pedestrian and vehicle rights of way

125 (1) The driver of a motor vehicle shall yield the right of way to a pedestrian lawfully within a crosswalk.

(2) Whenever a vehicle has stopped at a crosswalk or at an intersection to yield to a pedestrian pursuant to subsection (1), it shall be an offence for the driver of any other vehicle approaching from the rear to overtake and pass the stopped vehicle.

(3) Every pedestrian crossing a roadway at any point other than within a crosswalk shall yield the right of way to vehicles upon the highway.

(4) This Section shall not relieve the driver of a vehicle or the pedestrian from the duty to exercise due care. *R.S., c. 293, s. 125; 1990, c. 36, s. 1; 2001, c. 12, s. 4.*

Crossing guard

125A (1) A crossing guard may direct children across a roadway only at a marked crosswalk and as part of the crossing guard's employment.

(2) Before directing children across a roadway, a crossing guard shall

(a) display an approved stop sign in an upright position so that it is visible to all approaching vehicular traffic;

(b) enter into the middle of the intersection while continuing to display the stop sign; and

(c) ensure that all approaching vehicles have stopped.

(3) When a stop sign is displayed as required by subsection (2), the driver of any vehicle approaching the crosswalk shall stop no closer than five metres from the crosswalk.

(4) It is an offence for a driver of a vehicle to fail to obey a crossing guard who is directing children in a crosswalk. *2001, c. 12, s. 5.*

Offence to disobey traffic signal

126 At an intersection where traffic is controlled by traffic signals, it shall be an offence for a pedestrian to disobey the instruction of any traffic signal placed in accordance with this Act unless otherwise directed by a peace officer. *R.S., c. 293, s. 126.*

Movement of pedestrians

127 (1) Pedestrians shall move whenever practicable upon the right half of crosswalks.

(2) Where sidewalks are provided it shall be unlawful for any pedestrian to walk along and upon an adjacent highway.

(3) Where sidewalks are not provided, any pedestrian walking along and upon a highway shall, when practicable, walk only on the left side of the roadway or its shoulder facing traffic which may approach from the opposite direction. *R.S., c. 293, s. 127.*

279 (2) WHENEVER THE REGISTRAR SUSPENDS IMMEDIATE SUSPENSION OR REVOCATION BY REGISTRAR

the license or the privilege of obtaining a license of any person for any reason set forth in subsection (1), he shall immediately notify the licensee and afford him an opportunity of a hearing or of offering an explanation and upon such hearing or explanation the Registrar shall either rescind his order of suspension, reinstate the license or privilege of obtaining a license subject to any conditions prescribed by the Registrar or, good cause appearing therefor, may suspend the license or the privilege of obtaining a license of such person for a further period or revoke said license.

(2A) Where a hearing is held or an explanation offered pursuant to subsection (2) following the suspension of the license of a person for the reason that the Registrar believes that the person is afflicted with a mental or physical infirmity or disability rendering it unsafe for the person to operate a motor vehicle upon the highway, the Registrar may refer the information on the infirmity or disability that is available to the Registrar to a medical advisory committee appointed by the Minister pursuant to regulations respecting the classification of drivers' licenses for an opinion on the ability of the person to operate a motor vehicle.

(3) The Registrar may suspend or revoke the driver's license or the privilege of obtaining a driver's license of a person upon receipt of a recommendation to that effect from a court, judge or justice.

(4) The Registrar is hereby authorized to suspend or revoke the right of any non-resident to operate a motor vehicle in this Province for any cause for which the license of a resident driver may be suspended or revoked, and any non-resident who operates a motor vehicle upon a highway when his

right to operate has been suspended or revoked by the Registrar shall be guilty of an offence and upon conviction shall be punished as provided in Section 295.

(5) The Registrar is hereby authorized to suspend or revoke the license of any resident of this Province upon receiving notice of the conviction of such person in another province or state of an offence therein which, if committed in this Province, would be grounds for the suspension or revocation of the license of a driver, and the Registrar is further authorized, upon receiving a record of the conviction in this Province of a non-resident driver of a motor vehicle of any offence under the motor vehicle laws of this Province, to forward a certified copy of such record to the motor vehicle administrator in the province or state wherein the person so convicted is a resident.

(6) When the Registrar has reason to believe that the holder of a driver's license is incompetent to drive a motor vehicle or is afflicted with mental or physical infirmities or disabilities rendering it unsafe for him to drive a motor vehicle upon the highways, the Registrar may, by notice in writing, require that person within ten days after the date of the notice to submit to examination by an examiner and by a qualified medical practitioner or practitioners and to furnish the Registrar with the reports of the examiner and the medical practitioners.

(7) Every qualified medical practitioner may report to the Registrar the name and address of any patient attending upon him for medical services who, in the opinion of such qualified medical practitioner, is afflicted with mental or physical infirmities or disabilities rendering it unsafe for such patient to drive a motor vehicle upon the highways.

(8) Every registered psychologist may report to the Registrar the name of any person who, in the opinion of the registered psychologist, is afflicted with an emotional or mental disability that may interfere with the safe operation of a motor vehicle by that person.

(9) No action shall be brought against a qualified medical practitioner or a registered psychologist for making a report in accordance with subsection (7) or (8), respectively.

(9A) In this Section,

(a) "qualified medical practitioner" means a medical practitioner as defined in the Medical Act;

(b) "registered psychologist" means a person whose name is on the Register of Psychologists and whose registration is not suspended or cancelled.

(10) The Registrar may suspend or revoke the driver's license of a person who fails or refuses to submit to an examination when required so to do under subsection (6). *R.S., c. 293, s. 279; 1999, c. 11, s. 8; 2001, c. 12, s. 9.*

REQUEST FOR INFORMATION AND RE-EXAMINATION

280 (1) The Registrar by written notice may, from time to time, require the holder of a driver's license to furnish the Registrar, within ten days after the date of the notice, with information respecting the age of the person, his driving experience, his physical condition and such other matters relevant to his driving ability or his fitness to be licensed as the Registrar requires.

(2) The Registrar by written notice may require the holder of a driver's license to submit himself to examination or re-examination by an examiner designated by the Registrar within ten days after the date of the notice.

(3) No person shall fail or refuse to furnish the Registrar with information or to submit himself to examination or re-examination when required so to do by the Registrar under this Section.

(4) When a person fails or refuses to furnish the Registrar with information required by him under this Section or fails or refuses to submit himself to examination or re-examination when required by the Registrar to do so, the Registrar may suspend the driver's license of the person until he furnishes the required information or submits to examination or re-examination, as the case may be.

(5) The Registrar may require a person to attend and successfully complete a driver improvement program or to attend and successfully complete a course of instruction in driver training specified by the Registrar and may suspend the driver's license of a person who fails to attend or successfully complete the course or program required by the Registrar.

(6) A certificate signed or purporting to be signed by the Registrar and sealed with the seal of the Department that a person has or has not furnished the Registrar with information required by the Registrar under this Section or has or has not submitted himself for examination or re-examination by an examiner, as required by the Registrar under this Section, shall be received in evidence in any prosecution under this Section without proof of the signature or seal on the certificate, and shall be prima facie proof of the facts stated therein. *R.S., c. 293, s. 280; 1994, c. 24, s. 7.*

POINT SYSTEM TABLE	
Conviction Section(s) Number	Violated of Points
1. Careless and imprudent driving 100	6
2. Speeding or dangerous driving 101	6
3. Failing to stop at an accident 97 or to perform any duty imposed by Section 97	6
4. repealed 2002, c. 20, s. 8.	
5. Racing 163	6
5A. BAC exceeds .00 100A(1)	6
5B. Failure to comply with demand 100A(4)	6
6. Passing school bus or failure to obey crossing guard 103(3), 125A	6
7. Improper passing 114,115(1)(a)	4
8. Speeding in excess of prima facie speed limit 102	4
9. Speeding in excess of posted limit 103(1)	4
9A. Speeding in excess of posted limit by 31 kilometres per hour and over 106A(c)	4
9B. Speeding in excess of posted limit by between 16 and 30 kilometres per hour, inclusive 106A(b)	3
9C. Speeding in excess of posted limit by between 1 and 15 kilometres per hour, inclusive 106A(a)	2
9D. Failure to yield to pedestrian 125(1), (2)	4
9E. Failure to obey a traffic control person 107B	4
10. Failing to obey traffic signs or signals or 83(2),93(2) 122,132,133, yield right of way 134	2
11. Driving to left of centre line 115(1)(c), 115(2)110,115(1)(b),	2
12. Operating motor vehicle without adequate brakes 181	2
13. Offences involving the use of a motor vehicle in motion under the following sections 70,70A,70B, 75(5),107,111, 112,117,118, 119,120,123, 164,165, 169(2), 175(2), 175(3), 175(4), 178,185	2

(3) When four or more points are entered on the record of a person the Registrar shall give him a warning notice.

(4) When six or more, but less than ten, points are entered on the record of a person the Registrar may require him to attend before the Registrar, or an examiner or other person designated by the Registrar, at a place and within a period prescribed by the Registrar for an interview with a view to assisting the person to improve his driving habits.

(5) If a person fails or refuses to attend and to participate in an interview when requested to do so by the Registrar pursuant to subsection (4), the Registrar may suspend his driver's license, or the privilege of obtaining a driver's license until he attends and participates in an interview with the Registrar or an examiner or other person designated.

(6) Subject to subsection (7), when ten or more points are entered on the record of a person in respect of convictions for violations of this Act entered against him within a period of twenty-four months, the Registrar shall suspend the driver's license, or the privilege of obtaining a driver's license, of the person for a period of six months.

(7) A suspension of a driver's license or privilege of obtaining a driver's license pursuant to subsection (6) shall not be made until after thirty days from the date of the conviction that increased the total number of points entered on the record of the driver to ten or more points or until the conviction has been affirmed on appeal, or the appeal is dismissed or discontinued, unless the driver notifies the Registrar that he is not appealing the conviction.

(7A) A person whose driver's license or privilege of obtaining a driver's license has been suspended pursuant to this Section shall, to have the driver's license or privilege of obtaining a driver's license reinstated, apply to the Registrar in the form and manner required by the Registrar.

(7B) The Registrar shall not reinstate a driver's license or the privilege of obtaining a driver's license pursuant to subsection (7A) until the Registrar is satisfied that all requirements pursuant to this Act have been completed by the applicant.

(8) When twenty-four months have elapsed from the date of a conviction for a violation of this Act that led to an entry of points on the record of a person, the Registrar shall deduct from the record the number of points entered on it in respect of that violation.

(9) When the driver's license, or the privilege of obtaining a driver's license, of a person has been suspended under this Section and the period of suspension has expired, the Registrar shall remove from the record of that person all points that were entered on it in respect of the period before the date of the suspension.

(10) Any driver's license or renewal thereof issued to a person after the expiration of a period of suspension imposed pursuant to this Section shall be a probationary license for a period of twelve months from the date that a license was first issued to him after the said suspension period, and if three or more points are entered in the record of that person by reason of a conviction or

convictions entered against him within the said period of twelve months the Registrar shall suspend his driver's license or his privilege of obtaining a driver's license for a further period of six months.

(11) For the purpose of this Section, where a person makes a voluntary payment pursuant to Section 262, the person shall be deemed to be convicted of the offence or violation that he was alleged to have committed and for which he made the voluntary payment.

(12) The Registrar may deduct up to four points from the record of a person upon being satisfied that such person has successfully completed a self-improvement defensive driving course within the preceding year.

(13) Subsection (12) applies to points first entered and still existing on the person's driving record at the time when the Registrar acts.

(14) Notwithstanding subsection (12), the Registrar shall not deduct points from the record of a person who holds a class 7 or 8 driver's license as set out in regulations made pursuant to Section 66 or who is a newly licensed driver. *R.S., c. 293, s. 282; 1994, c. 24, s. 8; 2001, c. 12, s. 10; 2001, c. 44, ss. 5, 9; 2002, c. 20, s. 8; revision corrected.*

NEWLY LICENSED DRIVER

283 (1) In this Section,

(a) "newly licensed driver" includes a person who was a newly licensed driver under this Act immediately prior to the coming into force of this Section and such person remains a newly licensed driver for the purpose of this Section until the expiry of the period established on the person's driver record maintained by the Registrar;

(b) "points" means points that are entered and remain on the record of a person pursuant to Section 282.

(1A) A person who has been issued a class 7 or 8 driver's license, as set out in regulations made pursuant to Section 66, immediately prior to the coming into force of this Section is a newly licensed driver for the purpose of this Section for four years commencing with the date the person qualifies for another class of driver's license.

(2) Where two or more points are entered on the record of a holder of a class 7 or 8 driver's license as set out in regulations made pursuant to Section 66 the Registrar may require him to attend before the Registrar or an examiner or other person designated by the Registrar, at a place and within a period prescribed by the Registrar for an interview with a view to assisting the person to improve his driving habits.

(3) Where four or more points are entered on the record of a holder of a class 7 or 8 driver's license as set out in regulations made pursuant to Section 66 the Registrar shall suspend for a period of six months the person's license and his privilege of obtaining a driver's license.

(4) Where three points are entered on the record of a newly licensed driver the Registrar may give him a warning notice.

(5) Where four or five points are entered on the record of a newly licensed driver the Registrar may require him to attend before the Registrar, or an examiner or other person designated by the Registrar, at a place and within a period prescribed by the Registrar for an interview with a view to assisting the person to improve his driving habits.

(6) Where six or more points are entered on the record of a newly licensed driver the Registrar shall suspend for a period of six months the person's driver's license and his privilege of obtaining a driver's license.

(7) Except as provided in this Section, all the provisions of Section 282 apply mutatis mutandis to persons and proceedings to which this Section applies.

(8) This Section applies only to persons who become holders of driver's licenses on or after the first day of July, 1966. *R.S., c. 293, s. 283; 1994, c. 24, s. 9; revision corrected.*

PENALTIES

Category A offences

292 Any person who violates any of the provisions of Section 14, 18, 30, 31, 34, 35 or 58, subsection (3) of Section 71, subsection (2) of Section 78, Section 95, 127, 128, 143, 144, 146, 148, 149, 155 or 156, subsection (1) of Section 158 or Section 159, 160, 162, 166, 167, 168, 169, 170A, 171, 172, 177, 182 or 183 is guilty of an offence and liable on summary conviction to the penalties provided for a category A offence in the Summary Proceedings Act. *2002, c. 10, s. 20; 2005, c. 8, s. 9.*

Category B offences

293 Any person who violates any of the provisions of Section 16, 28, 37, 38, 40, 50, 62 or 69, subsection (2) of Section 83, Section 90, 93, 113, 118, 119, 120, 122, 123, 126, 129, 133, 134 or 135, subsection (1) of Section 136 or Section 138, 139, 140, 141, 151, 161, 165, 174, 175, 178, 179, 181A, 184, 185, 186, 187, 198, 201, 202 or 246 is guilty of an offence and liable on summary conviction to the penalties provided for a category B offence in the Summary Proceedings Act. *2002, c. 10, s. 20; 2005, c. 8, s. 10.*

Category C offences

294 Any person who violates any of the provisions of Section 20, 23, 24, 26, 27, 29, 65[,] 70, 70A or 70B, subsection (1) of Section 83, Section 94 or 96, clause (a) of Section 106A, Section 110, 111, 112, 116, 117, 121, 124, 130, 132, 145, 150, 164, 170, 181 or 188, subsection (1) of Section 191, subsection (4) of Section 192, Section 199 or 200, subsection (9) of Section 201 or Section 204, 242, 258, 260, 289 or 290 is guilty of an offence and liable on summary conviction to the penalties

provided for a category C offence in the Summary Proceedings Act. *2002, c. 10, s. 20; 2005, c. 8, s. 11.*

Category D offences

295 Any person who violates any of the provisions of Section 6, 11, 13, 57, 60, 64, 75, 76 or 82, subsection (10) of Section 98, Section 99, 99A, 102, subsection (1) or (4) of Section 103, clause (b) of Section 106A, Section 107, 107A, 114, 115, 190 or 210, subsection (3) of Section 280 or Section 303 is guilty of an offence and liable on summary conviction to the penalties provided for a category D offence in the Summary Proceedings Act. *2002, c. 10, s. 20; 2005, c. 8, s. 12.*

Category E offences

296 Any person who violates any of the provisions of Section 47, 63 or 108 is guilty of an offence and liable on summary conviction to the penalties provided for a category E offence in the Summary Proceedings Act. *2002, c. 10, s. 20;*

Category F offences

297 Any person who violates any of the provisions of Section 32, 33, 97, 100, 100A, 100B or 101, subsection (3) of Section 103, clause (c) of Section 106A, Section 107B, 125, 125A or 131, subsection (2) of Section 136 or Section 163, 173, 182A, 199 or 303H is guilty of an offence and liable on summary conviction to the penalties provided for a category F offence in the Summary Proceedings Act. *2002, c. 10, s. 20; 2004, c. 42, s. 15; 2005, c. 8, s. 13.*

Category G offences

298 Any person who violates any of the provisions of Section 41, 43, 53, 56, 80 or 97, subsection (11) of Section 98, subsection (8) of Section 201, Section 214, subsection (4) of Section 279, subsection (1) or (2) of Section 287 or Section 301 is guilty of an offence and liable on summary conviction to the penalties provided for a category G offence in the Summary Proceedings Act. *2002, c. 10, s. 20; 2005, c. 8, s. 14.*

Category H offences

299 Any person who violates any of the provisions of Section 230 is guilty of an offence and liable on summary conviction to the penalties provided for a category H offence in the Summary Proceedings Act. *2002, c. 10, s. 20;*

Category I offences

299A Any person who violates any of the provisions of Section 46, 49, 51 or 287 is guilty of an offence and liable on summary conviction to the penalties provided for a category I offence in the Summary Proceedings Act. *2002, c. 10, s. 20; 2005, c. 8, s. 15.*

APPENDIX B

Crosswalk Safety: Current Themes in Literature

Prepared for the Crosswalk Safety Task Force

By: Sarah Chisholm & Catherine Kennedy

Introduction

Each year an approximated one million people die and around 10 million endure serious injury on the roads of the world. For individuals aged 3-35 years road traffic crashes are recognized as the leading cause of death and disablement by the World Health Organization (Duperrex, Bunn & Roberts, 2002). Pedestrian safety in and out of crosswalks is an especially significant concern in the province of Nova Scotia. On average, one pedestrian per day will be involved in a motor vehicle collision in the province. Each month in Nova Scotia, three pedestrians will be seriously injured, and one will be killed by a motor vehicle (Road Safety Advisory Committee, 2006). Most of these pedestrians are struck while crossing the street. It is recognized in the literature that pedestrian crashes are influenced by a variety of risk factors which affect their occurrence and severity (U.S. Department of Transportation – Federal Highway Administration, 2006). Society's most vulnerable groups, young children and the elderly, are among the most at risk as pedestrians. In order to protect these susceptible groups as well as all pedestrians, efforts must be undertaken in improving crosswalk and pedestrian safety within the province that will serve to reduce the risk of injury or death.

The purpose of this literature review is to synthesize a collection of current research relating to crosswalk safety. The three E's: Education, Engineering and Enforcement are recognized to contribute, and most effectively initiate change when implemented in conjunction with one another as part of an integrated approach. The National Cooperative Highway Research Program (NCHRP) as cited by the U.S. Department of Transportation (2006) recognizes that walking is a basic human activity, and that almost all individuals are in the role of pedestrian at one time or another throughout the life span. Walking is considered to be a fundamental mode of human mobility; however it is not always recognized in the design and renovation of infrastructure. The following is an investigation into current literature regarding the three E's, as well as legislation in order to present a thorough summary of interventions for pedestrian safety.

Education

In working to prevent pedestrian injury educational interventions designed to teach pedestrians how to cope with the traffic environment are considered essential to the success of any strategy, and road safety education targeting pedestrians is recommended in high, middle and low income countries around the world (Duperrex, Bunn & Roberts, 2002). In referencing target groups for crosswalk safety and general pedestrian safety activities, the areas of focus in the literature continue to be youth and school-aged children, new drivers as well as the senior population (City Planning & Development Department – Kansas City, 2002). Appropriate and frequent education of both drivers and pedestrians in Nova Scotia is a necessary priority – and was identified throughout a crosswalk safety forum hosted by the Surface Transportation Sub-Committee of the Halifax Chamber of Commerce in January of 2007 (Halifax Chamber of Commerce, 2007). Evaluation of current education relating to crosswalks in the province is also considered to be a priority (Halifax Chamber of Commerce, 2007). The following sections will provide target group specific information regarding crosswalk education.

Children and School-based education

On average, every week in Canada, 80 child pedestrians are involved in a collision with a motor vehicle, totaling over 4,000 child pedestrians hit by motor vehicles annually (Safe Kids Canada, 2004). Pedestrian injuries are most common among 5-9 year old children, and in this age group, pedestrian injuries are the most common cause of serious head trauma. Pedestrian motor vehicle collisions are qualitatively different from other types of trauma in that very few of the victims escape injury. In contrast, 94% of occupants of vehicles involved in crashes are uninjured. The most common type of action by the child leading to pedestrian injuries is the midblock dash/dart-out and intersection dash actions. These account for 60-70% of the total for children under the age of 10.

There has been extensive research conducted that focuses on the effects of safety education on child pedestrians. Researchers have been attempting for decades to discover what effects, if any, receiving training on proper pedestrian behavior has on children of varying ages. Pedestrian skills training programs have long

been the mainstay of interventions to reduce child pedestrian injuries. These training programs are of variable length and intensity and have occurred both in school settings as well as community settings (Harborview Injury Prevention & Research Center, n.d.). Safe Kids Canada (2004) recognize that increased driver knowledge and attitude and increased child knowledge can lead to a reduction in pedestrian crashes, however increased child knowledge improves road behaviour in the short term only.

Many studies concluded that children who had been exposed to training displayed significant improvements in their knowledge of pedestrian safety and rules over their peers who did not receive such training (Zeedyk, Wallace, Carcary, Jones, & Larter, 2001; Tolmie, Thomson, Foot, & Whelan, 2005; Cook, Ricketts, Brown, Garcia, & Falcone, 2006). Generally, such studies were administered using pre-testing and post-testing results on both an experimental (trained) and control (untrained) group. Cook et al. (2006) also noted in their study that the presence of a classmate who had sustained an injury at the safety education session increased the improvements in test scores. When tested one month after the presentations, 100% of students who had an injured peer featured in their presentation showed improvements in safety knowledge, while only 66% of students who received the same safety education with no classmate involved in the presentation demonstrated improvement. Tolmie, Thomson, Foot & Whelan (2005) also found that peer-discussion improved knowledge retention regarding safe pedestrian behaviors significantly more than the presentations that did not include such discussion.

Risk Watch is a school-based curriculum addressing eight leading causes of childhood injury – including pedestrian hazards (Safe Kids Canada, 2004). The program was developed in the US by the National Fire Protection Association (SMARTRISK, n.d.). Risk Watch is targeted to youth from junior kindergarten to grade 8. The program aims to educate children on how to make safe choices when facing risk to reduce risk of injury (SMARTRISK, n.d.).

Further to that research, a number of studies found that observable pedestrian behavior in children who had received safety education was significantly improved following training (Rivara, Booth, Bergman, Rogers, & Weiss, 1991; Cross, et al., 2000; Cross, Hall, & Howat, 2003). However, Zeedyk et al (2001) found

that while training improved knowledge, it did not improve child pedestrian behavior. Conversely, Cross et al. (2000) found that training improved behavior and not knowledge. To confound the problem even further, there are researchers who have found that safety education in child pedestrians has no significant effect on knowledge or behavior in trained children (Luria, Smith, & Chapman, 2000; Zeedyk & Wallace, 2003).

In order to examine this problem more closely, Duperrex, Bunn, & Roberts (2002) conducted a thorough review of over a dozen studies in this area. After this review, they determined that they had not identified any conclusive evidence concerning the effect of safety education on child pedestrians. They noted that the methods used in the studies were generally flawed, and that it was impossible to determine whether the effects that were found in some studies would persist over time. Most notably, they were unable to find any relationship between modifications of knowledge or behavior and the occurrence of pedestrian injury, that is to say that there was no evidence that if one accepts that the education did in fact succeed in improving a child's knowledge or altering their behavior, there is no evidence that it would decrease their risk of becoming injured as a pedestrian (Duperrex, Bunn, & Roberts, 2002). These results suggest that any pedestrian safety education programs implemented in the future should be accompanied by a thorough analysis and evaluation of its relationship with pedestrian injury rates in order to determine its effectiveness.

A possible negative effect of pedestrian safety education for children is that it may cause parents to have a false sense of security regarding their child's knowledge and abilities, which can lead to children being in situations that they are not equipped to handle. Parents in general overestimate their child's knowledge of road safety and their ability to make decisions regarding their own pedestrian behavior (Dunne, Asher, & Rivara, 1992). Further to that, Zeedyk & Wallace (2003) found that after being shown an "edutainment" video regarding pedestrian safety which did not improve the knowledge of either the 5 year old child being shown the view or his/her parent, parents strongly believed that their child's knowledge had in fact been improved. It may be problematic for parents to have such faith in their children's abilities when it has been shown that children under 10 years of age can not be relied on to make safe estimations regarding the speed of oncoming traffic as well as the distance of the vehicles from themselves when making a crossing decision

(Connelly, Conaglen, Parsonson, & Isler, 1998). The same researchers felt that, based on their results, training young children to cross the road safely would not be sufficient in keeping them out of harm's way, and more effort should be placed on enforcement, environmental, and engineering strategies in areas most frequented by child pedestrians than on educating children when they are not developmentally able to consistently identify a safe crossing situation.

Seniors

Elderly Canadians are at elevated risk for pedestrian injury – with adults 65 and older (who demographically represent 12% of Canada's population) constituting over 30% of pedestrian related deaths. In a review of randomized control trials related to pedestrian safety education it was noted there was a lack of education interventions targeting the older population and few, if any, studies published on the effectiveness of educating older adults on pedestrian safety (Duperrex, Bunn, & Roberts, 2002). There is, however, information available on some of the best practices that can be used in teaching seniors about safety concerning their own mobility and other concerns. It has been found to be an important component in insuring the safety of older adults to educate seniors as well as the family unit or other service providers concerning current issues facing the elderly and their safety (Hewitt & Evans, 1999). In order to ensure that the elderly get the most from an educational experience, the training itself should focus on history and past experiences, to capitalize on the life experiences that many seniors posess and value. This can involve drawing on facts and experiences as well as statistics and other fact-based information (Smerz, 2001). In order for the older adults to be able to share their experiences, the presentations and sessions should be primarily interactive rather than lecture-based. Some other practices recommended for educating older adults include allowing plenty of time, counting on a talkative audience, considering visual or audio impairments, and using simple handouts without busy materials or flashy fonts (Smerz, 2001).

Public education

Many public information and education campaigns have addressed the issue of child pedestrian injury. The target audience of the campaigns vary, as some of these campaigns have been aimed at children,

others at parents, and still others at motorists (Harborview Injury Prevention & Research Center, n.d.).One of the most notable improvements in pedestrian safety resulting from public education occurred in Harstad, Norway. Officials in Harstad compiled quarterly Traffic Injury Reports (TIRs) that included victim stories, statistics, medical data, and incident locations. The reports were distributed to all households within the city, and had a special focus on reducing child pedestrian injuries. Over ten years, the city observed a 37% decline in traffic injury rates for all ages (59% in children). A comparable city, Trondheim, that did not use the TIRs experienced a 3% growth in their injury rates over the same period. Researchers also found that there was significantly higher awareness and positive attitudes towards traffic safety issues in Harstad than in Trondheim at the end of the ten year period. Finally 56% of citizens of Harstad that were surveyed reported that they had required good advice about traffic safety from the TIRs (Ytterstad, 2003).

Enforcement

There is a significant lack of research in the form of peer-reviewed articles or publicly available technical reports that focus on the enforcement of pedestrian safety (Porter, Anderson, Herbert Martinez, & Anderson, 2005). The U.S. Department of Transportation – Federal Highway Administration recognizes that there has been substantial work regarding the development of educational and engineering resources related to pedestrian safety, however there is a distinct lack of law enforcement activities (U.S. Department of Transportation, 2007).

Courtesy Promotes Safety is a police enforcement training program which is part of a 22 component program. It is a Triple E (Engineering, Education and Enforcement) approach to increasing Pedestrian and Bicycle safety (L. Malenfant, personal communication - July 17, 2007). Courtesy Promotes Safety originally started in Halifax and Moncton, over 20 years ago. The program has since been sustained through funding from several US governmental agencies including the National Highway Traffic Safety Administration, the National Academy of Sciences, the Florida Department of Transportation's Safety Office as well as Transport Canada. The program has trained police officers from Florida, New Jersey, Chicago and New Mexico. The program is a hands-on training program where traffic safety enforcement activities are facilitated, and on

average during the training police officers stop 50 to 75 drivers who fail to yield to a pedestrian at each enforcement site. The program has trained more police officers in this type of enforcement operation than any other group in the US and Canada. In total officers from more than 150 to 175 police agencies have been trained (L. Malenfant, personal communication - July 17, 2007).

Looking to other countries in the world, examples of law enforcement related to pedestrian safety can be seen where considerably safer environments for pedestrians are present. For instance, in Germany pedestrians are 3 times less likely to be killed than they are in the United States, and in The Netherlands, they are 6 times less likely to be fatally injured than their American counterparts (Pucher & Dijkstra, 2003). These countries have very advanced safety interventions for pedestrians and cyclists that have resulted in fewer injuries and safer streets for their citizens. From 1975 to 2001, through the implementation of numerous interventions, Germany has reduced its number of pedestrian fatalities by 82%, and The Netherlands has reduced their pedestrian fatalities by 73%. In terms of enforcement, both countries have police that are extremely strict when ticketing vehicles as well as pedestrians when traffic regulations are violated. In Germany, walking against a light will easily result in a ticket and fine, a practice that is not as common in North America. The fines and penalties that are given out in Germany and The Netherlands are also quite large, and the punishments severe, even for what many consider to be "minor" violations, such as not stopping at a crosswalk even when the pedestrian is still on the curb, or for being caught by red-light camera, which are also more common (Pucher & Dijkstra, 2003).

Legislation

A fine example of pedestrian safety legislation also comes from Germany and The Netherlands. The regulations in these countries strongly favour pedestrians and bicyclists rather than motorists. In most cases, when the pedestrian is found to have done something wrong in the case, the driver of the vehicle is still found partially at fault, as the justice system in those countries asserts that drivers should anticipate unsafe pedestrian behaviors and be able to respond. If an incident involves a child or an elderly pedestrian, regardless of the pedestrian's action, the driver is almost always found to be entirely at fault. This encourages drivers to

be more diligent with regards to pedestrian safety (Pucher & Dijkstra, 2003). Also, neither country allows right turns on red, reducing the risk of a pedestrian getting hit while they have the right-of-way.

Engineering

Engineering interventions are critical to crosswalk safety. Merely marking a crosswalk is not always sufficient, as some researchers have shown that there are in fact increased incidences of pedestrian collisions at marked crosswalks compared to their unmarked counterparts. This is especially true when the average daily traffic (ADT) for the crosswalk site exceeds 12 000, or when there are more than 2 lanes present (Zegeer, Esse, Stewart, Huang, & Lagerway, 2004). There are a number of possible reasons for this, including a false sense of security on behalf of pedestrians, and the incidence of "multiple-threat" collisions. Therefore, on roads with ADT's greater than 10 000, as well as on multi-lane roads, it is strongly recommended that further controls be implemented to reduce the significant danger associated with having a marked crosswalk in place in those locations (Zegeer, Esse, Stewart, Huang, & Lagerway, 2004). Engineering interventions generally fall into one of 3 categories: those that separate pedestrians from vehicles by time or space, those that increase the visibility and conspicuity of pedestrians, and those that reduce vehicle speeds (Retting, Ferguson, & McCartt, 2003). Several of the options in these categories are outlined below.

Countdown Signals

The countdown signal is a device that displays such additional information for pedestrians. Countdown signals are used in conjunction with conventional pedestrian signals to provide information to the pedestrian regarding the amount of time remaining to safely cross the street. It is hypothesized that pedestrians will use this information to make better decisions about when to enter the crosswalk. The main goals of this device are to increase pedestrian walking speed for those already in the crosswalk, and to discourage other pedestrians from entering the crosswalk if they do not have enough time to safely complete their crossing (Bechtel, Geyer, & Ragland, 2003). One concern regarding this device is that it is visible to vehicles as well, and may augment risk on the roads if drivers increase their speeds in response to how much time they have before the red light. In San Francisco, CA, countdown signals were installed that began

counting down with the flashing "DON'T WALK" signal. After their installation, the number of pedestrian injuries at those intersections declined by 52%, and the percentage of pedestrians who remained in the crosswalk when the signal switched to red showed a significant decrease. Finally, they found that the devices were viewed very favorably by pedestrians, who found them informative and felt safer crossing the streets that employed the signals (Markowitz, Sciortino, Fleck, & Yee, 2006). In a literature review of studies that researched their effects, Bechtel, Geyer, and Ragland (2003) found that countdown signals were effective at decreasing the amount of pedestrians still in the crosswalk at the red signal.

Pedestrian Detection Systems

A Pedestrian Detection System can be used in several ways. It can detect pedestrians waiting at the curb and call for a pedestrian crossing signal after a specified amount of time without any action on the part of the pedestrian, or it can delay the green light if it detects a pedestrian remaining in the crosswalk once the solid "Don't Walk" sign is illuminated. There are many types of sensors, including: ultrasonic, passive infrared, radar, piezometric, and video imaging. In a 1997 study, Beckwith (as cited in Bechtel, Geyer & Ragland, 2003) found that passive infrared sensors were the most effective, providing accurate and reliable detection with very few false detections. The implementation of pedestrian detection systems in Los Angeles, CA, Pheonix, AZ, and Rochester NY, resulted in an 89% reduction of pedestrian-vehicle conflicts, or "near-misses", and an 81% reduction of pedestrians who began crossing the street during the "Don't Walk" signal (Hughes, Huang, & Zegeer, 1999). Ekman and Draskocsky (1992a, 1992b, as cited in Bechtel, Geyer & Ragland, 2003) found in two separate studies that pedestrian detection reduced both vehicle-pedestrian conflicts and the number of pedestrians crossing on a red signal. They also noted that the signals increased vehicle waiting times, but decreased pedestrian waiting times. Davies (1992, as cited in Bechtel, Geyer, & Ragland, 2003) and Reading et al (1995, as cited in Bechtel, Geyer, & Ragland, 2003) studied the "PUFFIN" pedestrian detection system currently used in the UK and Australia and found that there is some evidence that the system increases compliance with signals, and that it improved pedestrian looking behavior. While many studies found that pedestrian detection systems were effective in improving pedestrian behavior and

reducing "near-misses", there is not yet information available on whether or not they result in crash reduction (Bechtel, Geyer, & Ragland, 2003).

Flashing Crosswalk Lights

Flashing crosswalk lights are designed to be used at uncontrolled crosswalk locations, where drivers must yield to pedestrians but generally do not believe that the pedestrian has the right-of-way (Bechtel, Geyer, & Ragland, 2003). Crosswalk lights can take the form of in-pavement flashers, or illuminated crosswalks (crosswalk pavement lights) and are engineered to increase yielding to pedestrians. To date, this system has provided some very positive results after implementation. They have been shown to increase driver yielding in numerous evaluations (Hakkert et al., 2002; Huang et al., 1999; Whitlock and Wienberger, 1998, as cited in Bechtel, Geyer, & Ragland, 2003), from 15-40% in the daytime and 30-85% at night. Hakkert et al. (2002) as well as Huang et al. (1999) found a reduction in pedestrian-vehicle conflicts at locations using the lights, and Miller (2001) found that there was an 80% reduction in crashes averaged over all current implementations of the lights that were studied (Bechtel, Geyer, & Ragland, 2003). Finally, Whitlock and Wienberger (1998, as cited in Bechtel, Geyer & Ragland, 2003) indicated that the lights produced a change in the initial braking point, from 0-60 feet during the day, and from 40-200 feet at night. Almost all researchers agreed that flashing crosswalk lights were an effective means of augmenting safety at unsignalized crossings.

Pedestrian Refuge Islands/Raised Medians

Pedestrian refuge islands, as well as raised medians, provide a place for pedestrians to stop in the middle of their crossing if it becomes unsafe to continue or if they don't have time to complete the full crossing. This can be especially helpful to those pedestrians, such as the elderly or disabled, who have a slow walking speed, and to individuals on wider roads that require more time to cross. The presence of a raised median or crossing island has been associated with a significantly lower crash rate on roads with multiple lanes, at both marked and unmarked crosswalks (Zegeer, Esse, Stewart, Huang, & Lagerway, 2004). It was also found that painted medians that weren't raised did not offer these same safety benefits. Additionally,

Fitzpatrick et al. (2006) found that medians and refuge islands have higher compliance rates on lower-speed roadways.

Yield to pedestrian signs

Research has shown that yield for pedestrian signs placed in advance of a crosswalk and pavement markings resulted in a reduction in pedestrian/motor vehicle conflict (Huybers, Van Houten & Malenfant, 2004). Sisopiku (n.d.) notes that signage can often be helpful in making crosswalks safer, however they also have the possibility of providing a false sense of security for pedestrians – making them feel as if their behaviour does not contribute to their safety, but they are protected by posted signs or lines painted on the road. Research has indicated that yield to pedestrian signs are effective in reductions in pedestrian/motor vehicle conflicts at multilane crosswalks when placed in advance of a crosswalk (Huybers, Van Houten & Malenfant, 2004). There is some variation between yield to pedestrian signs, in 2003 a study was conducted comparing traditional white and black Canadian yield to pedestrian signs to the same sign with a fluorescent yellow-green background. The research showed that regardless of the yellow-green signs as being rated more conspicuous in human factor studies, they did not have any effect on the percentage of motorists who yielded to the crosswalk at a further distance (Huybers, Van Houten & Malenfant, 2004). Yield to pedestrian signs as well as advance stop lines are noted as an essential component in decreasing motor vehicle conflict and increasing motorist yielding distance (Huybers, Van Houten & Malenfant, 2004).

Advanced Stop Lines

Zegeer et al. (2004) found that 17.6% of the pedestrian crashes in marked crosswalks that they studied were categorized as "multiple-threat" crashes. This means that a driver will stop in one lane at a crosswalk to allow a pedestrian to cross, but their vehicle will block the view of the pedestrian to drivers in other lanes who are approaching, who will then hit the pedestrian. Installing advanced stop lines up to 30 feet ahead of a marked crosswalk (on multi-lane road crossings) along with a sign labeled "STOP HERE FOR CROSSWALK" resulted in vehicles stopping further back from the marked crosswalk, which allowed

approaching cars in adjacent lanes to better see a crossing pedestrian (Van Houten, 1988; Huybers, Van Houten & Malenfant, 2004).

Traffic Calming Measures

Traffic calming is a technique used to reduce vehicle speeds in areas frequented by pedestrians by law (posted speed limits) as well as through physical barriers, which include raised intersections and crosswalks, traffic circles and roundabouts, narrowing roads, zigzag routes, curves, speed humps, and artificial dead ends that are created using midblock street closures. Another very effective traffic calming measure is the raised crosswalk, which serves as both a speed hump, and a way to make pedestrians more visible while they are in the crosswalk (Pucher & Dijkstra, 2003). They are particularly common on residential streets where there are high incidences of children playing, bicyclists cycling, and other pedestrian activity. In both The Netherlands and Germany, where pedestrian fatality and injury rates are extremely low, traffic-calming is a very common practice throughout the region. This means that most traffic is restricted to arterial routes with no such measures that are designed to handle high volumes of vehicle traffic rather than having high numbers of cars using more residential roads, putting pedestrians who use those roads at risk. Also, the reduction in speed helps to ensure that pedestrians are less seriously injured in the event of a collision, as the risk of pedestrian death in crashes rises from 5% at 20 mph to 85% at 40 mph (Pucher & Dijkstra, 2003). Traffic calming in Dutch neighborhoods has resulted in a 20% to 70% reduction in traffic incidents, and the same measures in Germany have reduced their serious traffic injury rate by as much as 56%. Traffic calming reduces pedestrian injury and makes residential neighborhoods much safer for children.

Single-Lane Roundabouts

Retting, Ferguson and McCartt (2003) identified the conversion of intersections into single-lane roundabouts as the most effective speed control intervention available. Roundabouts require drivers to yield at entry and lower their speeds. In Europe, converting conventional intersections into single-lane roundabouts has, on average, reduced the rate of pedestrian crashes at those intersections by about 75%.

Existing single-lane roundabouts also boast significantly lower pedestrian crash rates than traditional intersections with traffic signals (Retting, Nitzburg, Farmer, & Knoblauch, 2002).

A holistic approach to crosswalk safety encompassing the three E's: education, enforcement and engineering are crucial to a successful road safety strategy. Although many interventions address one or another E, the literature focuses on the need for an integrated approach, as well as the importance of thorough evaluation of programs and interventions. There are clear gaps in research of specific populations, and these gaps may be addressed by effective evaluation of interventions. Interventions regarding crosswalk safety for both pedestrians and drivers are varied throughout jurisdiction nationally and internationally – further research and evaluation is required to determine best practices regarding all three E's in crosswalk safety.

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